Sun Fire™ X4500-to-X4540 Migration User's Guide

For Systems Using Solaris OS and ZFS

Sun Microsystems, Inc.
www.sun.com

Part No. 820-6559-12
July 2009, Revision A

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Migrating the Sun Fire X4500 Server to a Sun Fire X4540 For Solaris OS ZFS

This document contains information and procedures for migrating your Sun Fire X4500 server to an X4540 server for Solaris™ OS and ZFS. ZFS allows seamless migration from the X4500 server to an X4540.

The procedures in this document are intended for technicians who have a high-level of understanding and skill in installing high-end servers.

Note – These upgrade procedures apply only to Sun Fire™ X4500 servers running the Solaris™ operating system using the ZFS file system.

Note – This migration is only for data disks/ZFS pools. OS mirror disks must be re-installed after the migration procedure.

- There is no support for migration on applications bound to physical devices.
- The X4540 server uses the LSI SATA disk controller chip on the system controller, while the X4500 server uses the Marvell SATA disk controller chip.

Note – For assistance with any part of this migration procedure, contact Sun Service.

Caution – Please follow the procedures as written so there is no data loss.

This upgrade procedure requires that you upgrade the hardware, software, and potentially the operating system on your system. Topics in this document include the following:

Note – The entire migration procedure can take as much as one hour.

Contents of the Migration Kit

- This document: *Sun Fire™ X4500-to-X4540 Migration User's Guide* (820-6559-12)
- Where To Find document
- Accessory kit
- X4540 service information poster
- X4540 System Controller
- X4540 front bezel label
- X4540 fan tray label
- X4540 rear migration notice label

Requirements

- Storage is managed in ZFS storage pools.
- The system is running `impitool` from the host. See *Sun Integrated Lights Out Manager User's Guide.*
- The migrated X4540 has a requirement of Solaris 10 5/09 OS or later.
- `hdtool` has been installed from the Tools and Drivers CD.

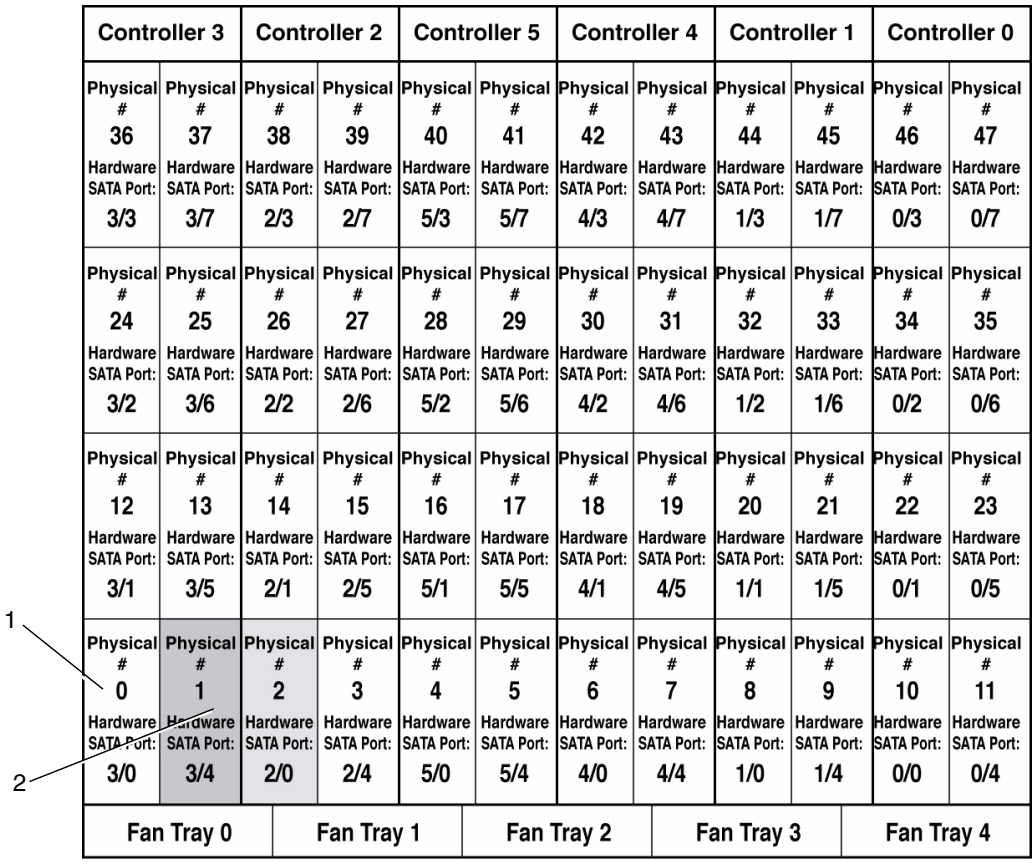
Before You Begin

To begin this procedure, it is recommended that your boot drive is located in Slot 0 and your mirrored drive is located in Slot 1.

Note – The Sun Fire X4500 and the X4540 have two different hard drive mapping schemes. See FIGURE 1 and FIGURE 2.

The procedure that follows ensures that your mirrored drive is not seen by the system as a data drive after the migration to an X4540. This procedure will instruct you to relocate your mirrored drive to a slot that will be seen as the mirrored drive slot in the X4540 drives mapping scheme. To do so, you will swap the drives in Slot 1 and Slot 2. Slot 2 becomes the mirrored drive Slot 8 under the new X4540 drives mapping scheme. See FIGURE 1 and FIGURE 2:

FIGURE 1 Drives Mapping Before Migration (X4500)

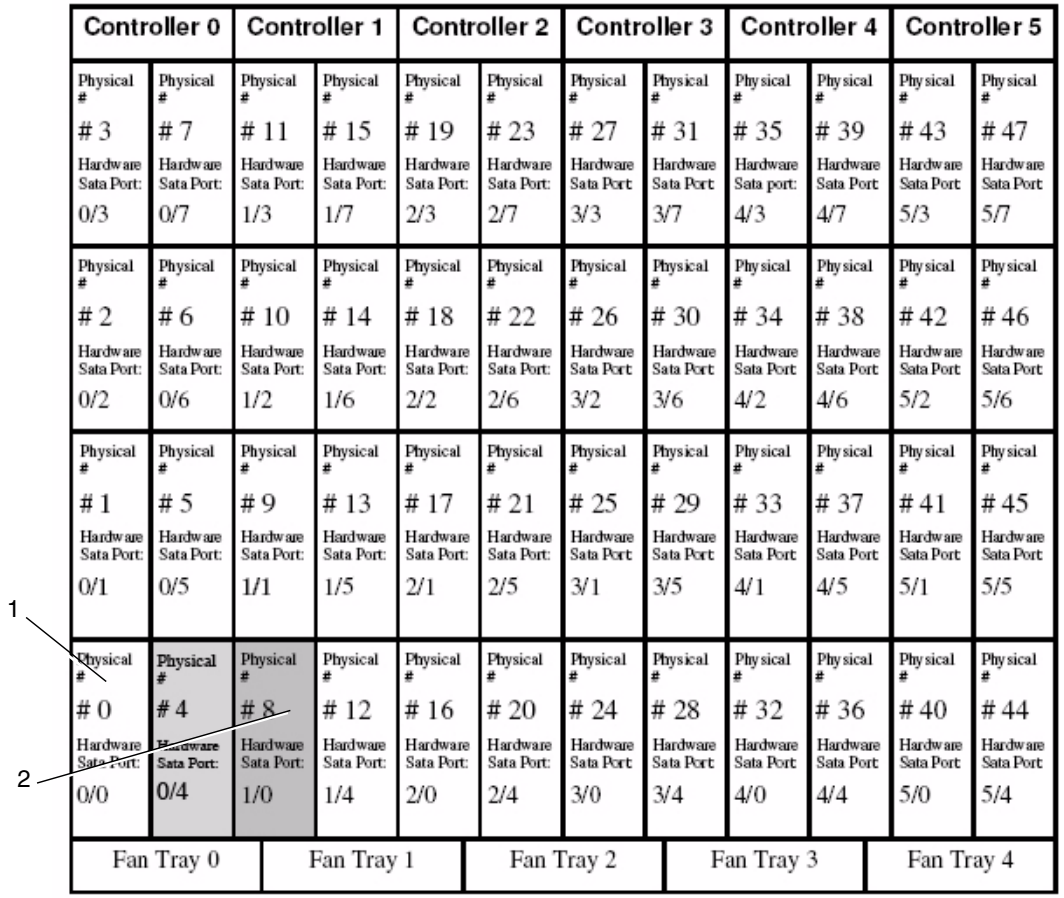


Legend for Illustration:

1	Boot disk
2	Mirrored disk

The default drive mapping for the X4540 is as follows:

FIGURE 2 Hard Drive Mapping After Migration (X4540)



Legend for Illustration:

1	Boot disk
2	Mirrored disk

▼ To Export Storage Pools

Note – Do not include spares in exported storage pools. Including them would cause them to be marked with incorrect pool designations when the pools are imported. Remove the spares before exporting the pools, then add them back before importing the pools.

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1. **Identify the spares in your ZFS storage pool by using the** `zpool status` *`pool_name`* **command.**

   For example:

   ```
   # zpool status tank
   ```

The following is output from this command:

```
pool: tank
 state: ONLINE
 scrub: none requested
config:

        NAME          STATE     READ WRITE CKSUM
        tank          ONLINE       0     0     0
          mirror      ONLINE       0     0     0
            c1t1d0    ONLINE       0     0     0
            c2t1d0    ONLINE       0     0     0
        spares
          c1t2d0      AVAIL
          c2t2d0      AVAIL
```

Notice that `c1t2d0` and `c2t2d0` are spares in this example. If no spares are configured in your ZFS storage pool, proceed to Step 3. If spares are configured in your ZFS storage pool, go the next step.

2. **Remove the spares from your storage pool by using the** `zpool remove` *`pool vdev`* **command.**

   The `zpool remove` command removes the given *`vdev`* from the pool and currently only supports removing hot spares.

```
# zpool remove pool vdev
```

vdev is the name of the device. In this case, use the *vdev* for the zpool spares.

For example:

```
# zpool remove tank c1t2d0
# zpool remove tank c2t2d0
```

If any of the spares are in use, you must replace the failed disks before continuing with the migration.

Devices which are part of a mirror can be removed using the `zpool detach` command. (Raidz and top-level vdevs cannot be removed from a pool.)

3. **Export the storage pool by using the `zpool export pool` command.**

   For example:

   ```
   # zpool export tank
   ```

4. **Verify that the storage pools have been exported by using the `zpool list` command:**

   ```
   # zpool list
   ```

5. **Proceed to the following migration procedures in the following order:**

   a. "To Relocate the Mirrored Hard Drive" on page 8

   b. "To Install the New X4540 System Controller" on page 9

   c. "To Check the ILOM and BIOS Versions on Your System Controller" on page 11

   d. "To Reinstall the OS and Importing zpools" on page 12

   e. "To Verify the Migration" on page 12

   f. "To Label Your X4540 Chassis" on page 14

6. **Add the spare disks back into the ZFS storage pool by using the appropriate `zpool add pool_name spare spare_name` command.**

   For example:

   ```
   # zpool add tank spare c4t2d0 c1t2d0
   ```

▼ To Relocate the Mirrored Hard Drive

If your boot disk is mirrored, you must follow these steps.

If your boot disk is not mirrored, be sure that the boot disk of your X4500 is located in Slot 0. Then go to "To Install the New X4540 System Controller" on page 9.

Caution – The failure to complete this step could result in losing data on your hard drive.

Note – The primary boot drive in Slot 0 does not change physical location.

Note – The power cord to the system must remain installed during this procedure.

1. **Manually illuminate the LED on the mirrored boot drive located in Slot 1 and the drive in Slot 2 by using the** `/usr/sbin/ipmitool` **command:**

   ```
   # /usr/sbin/ipmitool -I bmc sunoem led set hdd1.ok2rm.led on
   # /usr/sbin/ipmitool -I bmc sunoem led set hdd2.ok2rm.led on
   ```

2. **Keep a record of the** `/etc/vfstab` **by writing it down or coping the file for later use.**

3. **Shut down the OS and the system.**

   ```
   # shutdown -i 5 -g 0 -y
   ```

4. **Remove the drives access cover.**

Caution – Use the proper ESD grounding protection when handling computer components.

Caution – When the server is on, the drives access cover must be in place to ensure proper cooling. Do not remove a drive for more than **60** seconds when the server is on.

See "Removing the Drives Access Cover" in *Sun Fire X4500/X4540 Server Service Manual*.

5. **Locate the two drives by their blue Ready-to-Remove LEDs.**

   See FIGURE 1.

Note – After the migration to X4540, the boot drive in physical Slot 0 and mirrored drive in physical Slot 1 (under the X4500 drive map) will have physical drive positions of boot drive in physical Slot 0 and mirrored drive in physical Slot 8 (under the X4540 drive map scheme). See FIGURE 2.

6. **Swap the two drives with lit Ready-to-Remove LEDs.**

   The mirrored drive that was in physical Slot 1 must be installed into physical Slot 2. The data drive that was in Slot 2 must be installed into Slot 1.

Caution – Once the system boot mirror drive is relocated, it should always be installed back to its new X4540 slot (#8) after a service task.

7. **(Optional step) Use a black indelible-ink marker to obscure the old X4500 silk-screened drives slot numbers on the chassis drives.**

   After migration, the numbers will be incorrect for the X4540 drive scheme. You should delete all of the white drive numbers (except for #0) on the black fields as well as the yellow boot drive markings for the old X4500 drive 1. See FIGURE 1.

8. **Reinstall the drives access cover.**

Note – It is recommended to cross out the drives map on the X4500 cover label with a permanent marker pen (as that drives ID map will no longer be valid).

▼ To Install the New X4540 System Controller

1. **Remove all cables, including the power cords, from the rear of the system.**

Caution – Use the proper ESD grounding protection when handling computer components.

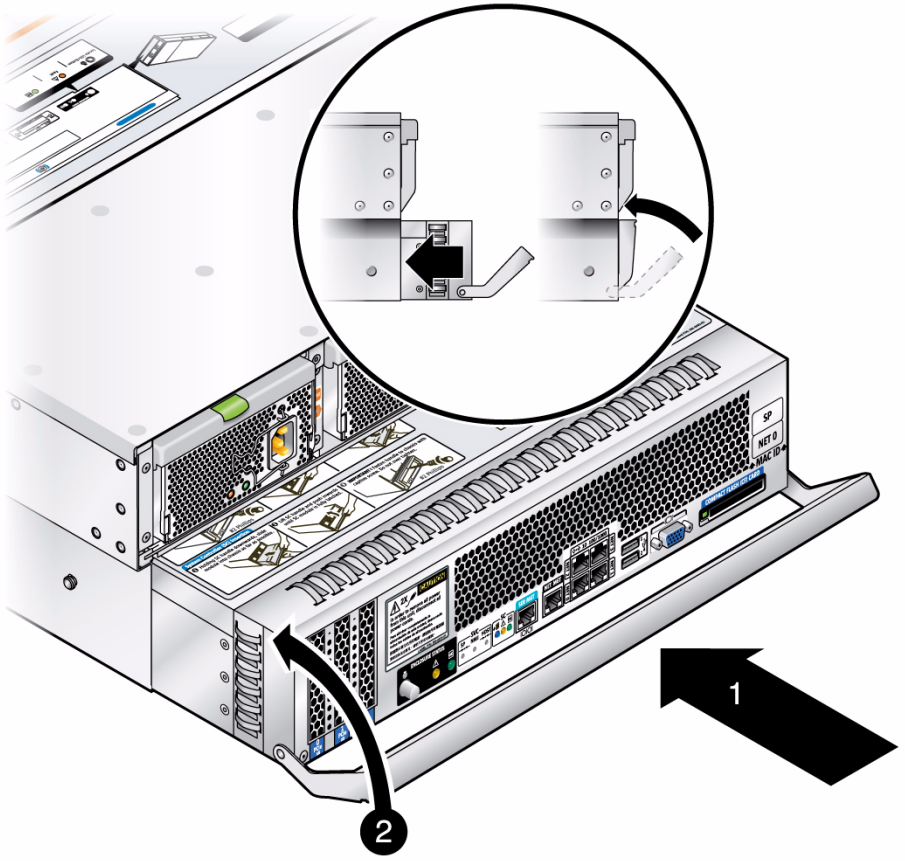
2. **Remove the existing X4500 System Controller by unscrewing the captive screw on the system controller handle and pulling down. Slide the unit out of the chassis.**

Caution – If present, remove the protective covers on the connectors at the rear of the new System Controller.

Caution – The X4500 System Controller that is removed may have some PCI cards installed. These PCI cards can NOT be placed into the new X4540 System Controller which only supports PCIe (PCI-Express) cards, not standard PCI cards.

3. **Install the new X4540 System Controller by sliding it into the chassis. Lift the controller handle until it engages with the system chassis.**

FIGURE 3 Installing the X4540 System Controller



4. **Secure the handle in place by tightening the captive screw in the handle.**
5. **Reinstall the cables to their proper ports and connectors.**

▼ To Check the ILOM and BIOS Versions on Your System Controller

The X4540 system controller must have the latest versions of Integrated Lights Out Manager (ILOM) and BIOS installed. Determine what versions have been installed on the system controller and upgrade to the latest versions if necessary.

1. **Ensure that the two 220 VAC power cords are securely attached to the power supplies by the PS cable retaining clips.**

2. **Determine the IP Address of the SP.**

   See "Determining the Service Processor IP Address" in *Sun Fire X4500/X4540 Server Integrated Lights Out Manager (ILOM) Supplement*.

3. **Check your firmware and BIOS versions.**

   See "Determining Your Current Firmware Versions" in *Sun Fire X4500/X4540 Server Integrated Lights Out Manager (ILOM) Supplement*.

4. **Check for the latest available firmware and BIOS versions for X4540.**

   `http://www.sun.com/servers/x64/x4540/downloads.jsp`

   If your newly installed system controller does not have the latest X4540 software version, continue to Step 5.

   If your system controller has the latest versions, skip to "To Reinstall the OS and Importing zpools" on page 12.

5. **Download the firmware.**

   See "Downloading New Firmware" in *Sun Fire X4500/X4540 Server Integrated Lights Out Manager (ILOM) Supplement*.

6. **Flash the ILOM/BIOS/LSI Firmware.**

   See "Flashing the ILOM/BIOS Firmware" in *Sun Fire X4500/X4540 Server Integrated Lights Out Manager (ILOM) Supplement*.

7. **Reset the Service Processor.**

   See "Resetting the Service Processor" in *Sun Fire X4500/X4540 Server Integrated Lights Out Manager (ILOM) Supplement*.

▼ To Reinstall the OS and Importing zpools

1. **Install Solaris 10 5/09 (or later version) operating system onto the boot disk.**

   See *Sun Fire X4500/X4540 Server Operating System Installation Guide*.

2. **Configure the boot disk's mirrored disk (optional).**

   See "Rebuilding the Preinstalled OS" in *Sun Fire™ X4500/X4540 Servers Administration Guide*.

3. **Import the zpools.**

   # **zpool import** *zpool_name*

4. **Verify the zpool imports are now recognized.**

   # **zpool list**

5. **Check the storage pool (optional).**

   # **zpool scrub** *zpool_name*

6. **Verify the zpool scrub.**

   # **zpool status** *zpool_name*

▼ To Verify the Migration

1. **Verify the new X4540 disk mapping by issuing the** `hd` **command.**

```
  # hd
-----------------------SunFireX4540-------Rear--------------------
3:   7:   11:  15:  19:  23:  27:  31:  35:  39:  43:  47:
c0t3 c0t7 c1t3 c1t7 c2t3 c2t7 c3t3 c3t7 c4t3 c4t7 c5t3 c5t7
^++  ^++  ^++  ^++  ^++  ^++  ^++  ^++  ^++  ^++  ^++  ^++
2:   6:   10:  14:  18:  22:  26:  30:  34:  38:  42:  46:
c0t2 c0t6 c1t2 c1t6 c2t2 c2t6 c3t2 c3t6 c4t2 c4t6 c5t2 c5t6
^++  ^++  ^++  ^++  ^++  ^++  ^++  ^++  ^++  ^++  ^++  ^++
1:   5:   9:   13:  17:  21:  25:  29:  33:  37:  41:  45:
c0t1 c0t5 c1t1 c1t5 c2t1 c2t5 c3t1 c3t5 c4t1 c4t5 c5t1 c5t5
^b+  ^++  ^b+  ^++  ^++  ^++  ^++  ^++  ^++  ^++  ^++  ^++
0:   4:   8:   12:  16:  20:  24:  28:  32:  36:  40:  44:
c0t0 c0t4 c1t0 c1t4 c2t0 c2t4 c3t0 c3t4 c4t0 c4t4 c5t0 c5t4
^b+  ^++  ^b+  ^++  ^++  ^++  ^++  ^++  ^++  ^++  ^++  ^++
-------*-----------*-SunFireX4540---*---Front----*---------*-------
```

Note – After migration, the system uses the X4540 disk map, which is different than the X4500 disk map. For example, by default, c1t2d0 on X4500 changes to c4t2d0 on the X4540, and c2t2d0 changes to c1t2d0.

TABLE 1 compares the controllers and drive locations before and after the migration. It reflects the latest X4500 and X4540 boot controller and disk slots if the system has installed Solaris without other devices attached.

Note – For X4500, an installed USB storage device changes the controller number. For X4540, an installed compact flash storage device changes the controller number.

TABLE 1 Drive Swap Migration Summary

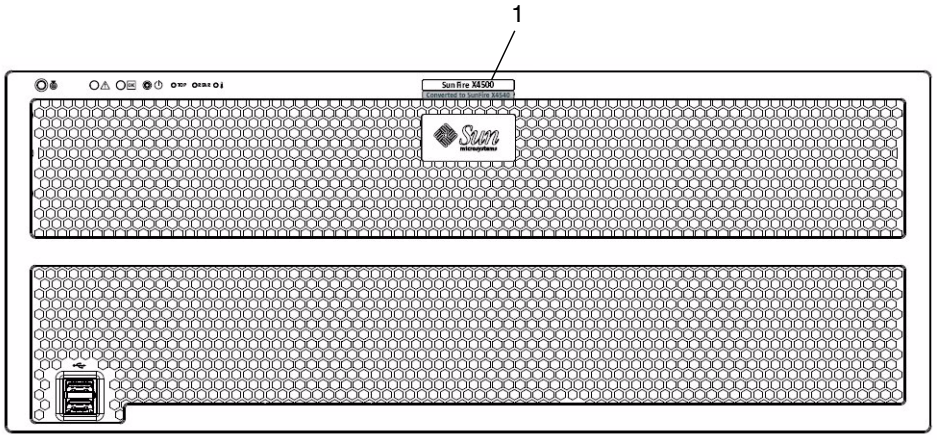
System	Boot Controller	Boot Drive Slot	Mirrored Drive Controller	Mirrored Drive Slot
X4500	c3	0	c3	1
Migrated X4540	c0	0	c1	8

2. **Refer to the service information poster for the new drives map and other updated X4540 service information.**

▼ To Label Your X4540 Chassis

1. **Apply the label "Converted to Sun Fire X4540" below the existing Sun Fire X4500 nameplate as shown in** FIGURE 4**:**

FIGURE 4 "Converted to Sun Fire X4540" Label

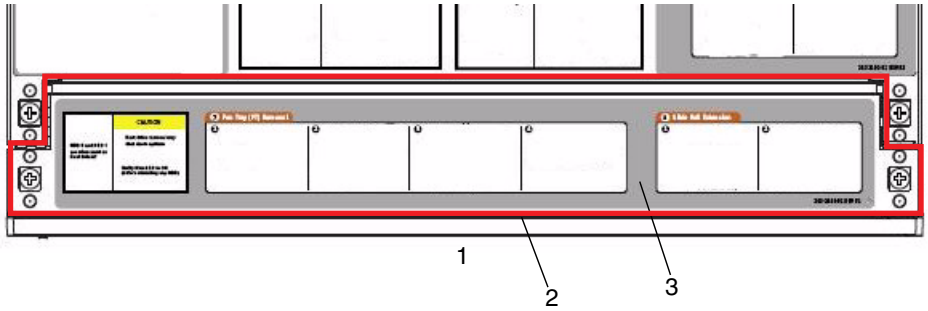


Legend for Illustration:

1	"Converted to Sun Fire X4540" Label

2. **Remove the existing fan tray access cover label.**
3. **Apply the X4540 fan tray access cover label as shown in** FIGURE 5**.**

FIGURE 5 Applying the Fan Tray Access Cover Label

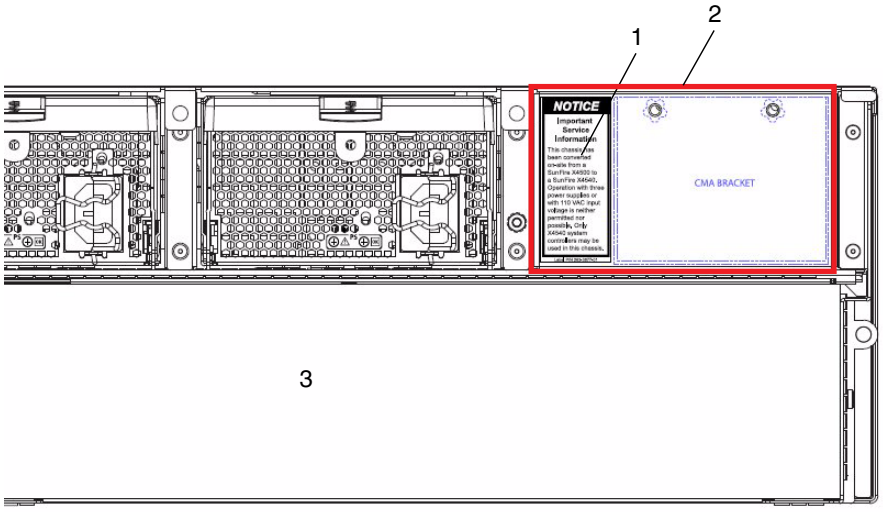


Legend for Illustration:

1	Top view, front of system
2	Fan tray access cover
3	Fan tray access cover label

4. **Apply the rear migration NOTICE label onto the CMA attachment plate as shown in** FIGURE 6**:**

FIGURE 6 Applying the Rear Migration Label



Legend for Illustration:

1	Rear migration label
2	CMA attachment plate
3	System Controller

Note – This migrated system does not support a third power supply. Operation with three power supplies or with 110 VAC input voltage is neither permitted nor possible.

Note – Only X4540 system controllers may be used in this chassis.